Moreover, the mere fact that Verizon VA has relied on its current deployment plans as the underpinning for the assumptions in its forward-looking network does not make those assumptions *per se* inefficient or unreasonable. To the contrary, as a price-cap regulated company today, Verizon VA has every incentive to adopt efficient, forward-looking technology deployment plans.[75]

Q. So should the Commission adjust the percentages of UDLC versus IDLC or TR-008 versus GR-303 in Verizon VA's studies?

A. No, it should not. Verizon VA's assumptions are aggressively forward-looking.

D. VERIZON VA'S CABLE, CONDUIT, AND POLE COSTS ARE CORRECTLY CALCULATED

1. The VRUC Database

Q. How does Verizon VA use the Vintage Retirement Unit Cost (VRUC) database in its studies?

A. Verizon VA uses the VRUC database to calculate the per unit costs of copper cable. Verizon VA used VRUC data to calculate the average, per-unit, installed copper cable investment for the years 1997-1999, according to cable type, cable size, and structure type. For each combination of

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[75] Even AT&T/WorldCom implicitly concede that price cap regulation has this effect. *See* Murray Rebuttal at 21 ("*The efficiency incentives of price caps* could not have affected Verizon's decisions concerning plant deployed before price caps went into effect.") (emphasis added).

copper cable and structure type (*e.g.*, underground copper cable), Verizon VA used these average installed investment levels to develop a regression showing the relationship between cable size and per-unit investment for that type of cable. This relationship was then used to develop per-unit cable investment based on the cable size needed for feeder and distribution areas.

Q. What are AT&T/WorldCom's contentions with respect to the validity of the loop investment data contained in the VRUC database?

A. AT&T/WorldCom contends that "VRUC unit costs are not derived from actual outside plant placement projects, but instead contain what appear to be estimated cable installation costs resembling those typically found in a cost estimating tool." [76] In support of this conclusion, they point to patterns such as changes in certain installed cable prices from 1997 to 1998 as reflected in the VRUC data, which they contend cannot be accurate reflections of real projects.

Q. Are AT&T/WorldCom correct in asserting that "VRUC unit costs are not derived from actual outside plant placement projects?" [AT&T/WorldCom Rebuttal Panel at 32.]

A. No. The VRUC data is developed using data about actual cable installation projects from Verizon's Detailed Continuing Property Records

76/ AT&T/WorldCom Rebuttal Panel at 32.

("DCPR") database and Verizon VA's accounting data. Thus, the 1997 and 1998 VRUC data that AT&T/WorldCom argue must be hypothetical were in fact developed directly from actual cable installation projects. The patterns in this data that lead AT&T/WorldCom to suggest otherwise are the result of certain limitations in the accounting data reflecting such projects. Where appropriate, Verizon VA has taken steps to minimize any effect that these limitations in the accounting data have on the loop cost studies.

Q. Please explain how Verizon develops VRUC data.

A. As noted, certain limitations constrain Verizon VA in developing this cable installation costing database. The first limitation arises from the lack of sufficiently granular data to identify investment by cable size from Verizon's accounting records. Underlying investment data for cable installations are reflected in Verizon's accounting data by structure and cable type (*i.e.*, aerial copper, aerial fiber, buried copper, buried fiber, etc.), but not by cable size. Indeed, certain activities reflected in the investment data — for example, splicing — cannot be broken down and accounted for by cable size category, because they may involve multiple cable sizes at the same time.[77] Thus, Verizon develops VRUC data by

[77] For example, a splicing job on a new installation may involve connecting a 900-pair feeder cable to a 600-pair feeder cable at a point where the feeder cable is tapered.

cable size using certain assumptions about the relative differences in cost among the different cable sizes.

The second limitation is the high variability of installed investment per unit of cable from year to year, much of which is not the product of changes in the underlying costs of installing cable. Several factors account for this variability. For example, the Commission's accounting rules concerning when new cable investments can be recorded on Verizon's books can produce significant apparent variations in per-unit investments from year to year. Under the Commission's accounting rules, the dollar investment for installed cable facilities cannot be recorded on Verizon's books until the facilities are actually used to provide service. The quantities of equipment, however, are recorded in Verizon's DCPR database as the field personnel complete the installation of the equipment. Thus, the installed cable quantities reflected in the DCPR database may include jobs that are completed toward the end of a calendar year, but whose associated investment dollars will not be reflected in the company's accounting data until the next year. For that first year, when the costs of the cable are not yet booked, the resulting average cable investment reflected in the year's VRUC data will be understated; the next year will see the new investments reflected in Verizon VA's accounts, but without a corresponding increase in the cable quantities in that next year's DCPR data (because the cable quantities already had been added in the first year).

The resulting VRUC data would then overstate the average installed cable investments for cable placed in that second year.

Other factors such as weather conditions and type of terrain also obviously can impact the cost of particular cable installation projects. Because VRUC reflects Verizon's costs in connection with real projects, the complexity of the installation projects in a given year can impact VRUC cost data that year, even though there has been no across-the-board shift in the cost of installing cable. Accordingly, apparent differences in installed cable prices from year to year may in fact reflect differences in the particular installation projects from one year to another; years in which a higher percentage of projects involved more costly procedures, such as laying cable in a rocky terrain, will result in a higher average installed cable price for the relevant year, even though there has been no across-the-board shift in the underlying costs of placing cable across the entire network.

Q. How did Verizon VA determine investment by cable size if investment data is not tracked in that manner?

A. To obtain investments by size of cable for VRUC, Verizon spreads the investments reflected in each account across each cable size within that account based on an extensive analysis of the relative costs of installing different sizes of cable. This process generally can be described as follows:

1. A set of "preliminary unit costs" (PUCs) for a base year is developed based on unit cost estimates for each cable size within an account (*e.g.*, for each underground copper cable size).

2. To calculate the retirement unit costs (RUCs) for a desired year, each PUC is multiplied by the total quantity of the relevant cable structure/size/type installed during that year, producing a preliminary investment for the cable structure/size/type for that year.

3. The preliminary investments for each cable size within an account (*i.e.*, a particular combination of structure and material type, such as underground copper cable) are then added together to produce a total preliminary investment for that account.

4. The total preliminary investment for each account is compared to the total actual investment for the account for the desired year. The percentage increase or decrease for the total account is then applied to each of the individual PUCs within that account to produce an RUC for each cable size within the account.

Verizon's PUCs were revised in 1998 based on an extensive analysis of unit costs over time and across several Verizon companies. The revised PUCs represented cable investments for each copper and fiber cable size for all structure types. All vintages of cable costs used in the loop cost study (*i.e.*, costs for 1997, 1998, and 1999) were developed using the 1998 PUCs as the base PUC.

Q. Does this spreading process explain why certain cable prices increased at exactly the same rate, as noted in the table at page 33 of the AT&T/WorldCom Rebuttal Panel?

A. Yes. The extensive analysis of investment data during the development of PUCs produces a set of relationships among the prices of different sizes of cables. Once these relationships are established, they generally will remain constant until new PUCs are developed. Thus, as overall investment within plant account changes from year to year, VRUC prices for the different cable sizes within that account generally will increase or decrease at the same rate until a new set of PUCs is developed. Thus, the fact that the VRUC prices for multiple sizes of underground copper cable increased at exactly the same rate from 1997 to 1998 merely reflects the manner in which VRUC data is calculated.

Q. Does the process used to calculate VRUC data also explain why, for all three structure types, the 1997 VRUC price for 600-pair copper cable is [VERIZON PROPRIETARY BEGIN] [VERIZON PROPRIETARY END] higher than the VRUC price for 300-pair copper cable and the 1997 VRUC price for 900-pair copper cable is [VERIZON PROPRIETARY BEGIN] [VERIZON PROPRIETARY END] higher than the price for 600-pair cable? [AT&T/WorldCom Rebuttal Panel at 35.]

A. Yes. The PUCs established prices for each cable size across all structure types.

Q. But is the VRUC data still valid to use for determining average cable investment, notwithstanding this averaging process and the resulting patterns?

A. Yes. The relationships in the 1998 PUCs clearly show unit costs that increase with cable size, as they should. They also show that the cost for each size of cable varies among structure types in reasonable proportions, with aerial cable being the least expensive and buried cable being the most costly. Using these relationships to distribute annual cable investments to each cable size within an account produces a reasonable estimate of annual cable investment by cable size.

Q. Do the increases in VRUC prices for copper cable from 1997 to 1998 reflect "excessive and unsupported inflation" that "far exceed[s] any reasonable measure of inflation over that period" as the AT&T/WorldCom Rebuttal Panel contends? [AT&T/WorldCom Rebuttal Panel at 33.]

A. No. Though AT&T/WorldCom point to a table showing apparently large increases in copper cable prices from 1997-1998 **[VERIZON PROPRIETARY BEGIN]**

[VERIZON PROPRIETARY

END], these increases do not, in fact, reflect inflation assumptions by Verizon. Instead, as explained above, these increases are the result of peculiarities in accounting rules and other factors that can cause significant fluctuations in VRUC data from year to year. There is no more reason to believe that the 1998 VRUC prices are artificially high than there is to believe that the 1997 VRUC prices are artificially low. Moreover, Verizon VA does not use the increase in VRUC's copper cable prices from 1997 to 1998 to estimate the impact of inflation on cable prices in future years. Consequently, there is absolutely no basis for comparing these increases to Verizon's TPIs or to the Turner TPIs, as the AT&T/WorldCom Rebuttal Panel attempts to do in the table on page 34 of the testimony.

Q. How do Verizon's loop cost studies minimize the effects of these variations in costs that are reflected in VRUC?

A. Verizon VA's loop cost studies minimize the effect of these fluctuations by utilizing a regression across multiple years of VRUC data to calculate unit costs for each size and type of cable. This regression analysis produces an average price for each cable size, and thus minimizes the effect of fluctuations from one year to another. The table below demonstrates how the regression analysis reduces the impact of year-to-year fluctuations in prices.[78]

TABLE 2

Underground (5C)

VRUC 1997	VRUC 1998	VRUC 1999	Regression Prediction
$3.03	$4.52	$3.09	$4.48
$4.11	$6.14	$4.21	$4.98
$4.96	$7.41	$5.07	$5.98
$7.08	$10.60	$7.25	$7.99
$8.60	$12.86	$8.81	$10.00
$10.18	$15.21	$10.42	$12.01
$13.67	$20.43	$13.99	$16.03
$19.02	$28.43	$19.47	$22.06
$24.04	$35.94	$24.61	$28.09

Q. Does AT&T/WorldCom's proposed remedy for the observed price increases understate Verizon VA's cable investment? [AT&T/WorldCom Rebuttal Panel at 36.]

A. Yes. AT&T/WorldCom propose using the 1997 VRUC copper cable prices (which are the lowest of the years used by Verizon VA) and adjusting those prices "to 2001 levels based on the appropriate telephone

[78] The figures in this table reflect the adjusted VRUC data discussed later in this testimony. All figures are inflation-adjusted.

plant index." This approach substantially understates Verizon VA's cable investments because, as noted above, the 1997 VRUC prices are almost certainly artificially understated due to the Commission's accounting rules. Thus, AT&T/WorldCom effectively replace representative average cable prices across multiple years with an artificially low set of copper cable prices from the year 1997. This produces a substantial understatement of Verizon's copper cable investments.

Q. AT&T/WorldCom also argue that the inflation index used by Verizon VA to index VRUC data to 2001 levels "appears high" and is likely subject to bias. Please respond. [AT&T/WorldCom Rebuttal Panel at 37.]

A. AT&T/WorldCom's argument is that an industry-wide index should be substituted for an index reflecting Verizon VA's own experiences. While Verizon VA has no quarrel with the Turner TPI proposed by AT&T/WorldCom, there is no good reason to use data that is not specific to Verizon, when Verizon VA has developed its own, very individualized index. Verizon's index, produced by Joel Popkin & Associates, is based on Verizon's actual incurred costs of purchasing the various materials under study, as well as its actual labor and overhead costs. The weights employed reflect the actual composition of the inputs that Verizon uses. Turner's index, on the other hand, is a general industry index which is designed to be appropriate for use by a wide variety of telephone companies. Though the Turner TPI does include data from actual telephone companies, that information generally is drawn from smaller companies; indeed, the Turner TPI does not include data from Verizon or other similarly large ILECs in its calculations. And the Turner TPI would not reflect certain factors specific to Verizon's region.

For example, because of significant growth in telecommunications competition in this region in recent years, labor contract rates have risen sharply for companies such as Verizon VA; this increase would be less true in other regions of the country where competition for telecommunications workers might be less intense. Similarly, if Verizon were to shift its purchasing more heavily toward fiber than copper, compared to the rest of industry, it would lose some of its relative price advantage in negotiated copper contracts at renewal time, but gain greater discounts in fiber purchasing. Verizon's own index would reflect this, while the Turner TPI obviously would not. Moreover, in general, the Turner TPI also would smooth out many price spikes that are reflected in Verizon's index, because several companies' experience is included. Thus, the apparent gap between the Turner TPI and the Verizon TPI figures is not indicative of the distortion AT&T/WorldCom seek to suggest is inherent in Verizon's costs, but instead reflect differences in the underlying data.[79]

2. Cable Sizing Issues

Q. Could you please explain AT&T's and WorldCom's criticism that Verizon's loop cost study fails to reflect that the average cost of metallic cable declines as cable sizes increase?

A. AT&T/WorldCom claim that Verizon VA's loop cost study overstates metallic cable costs by failing to take into account the cost savings associated with larger cable sizes.[80] Using the completely unrealistic example of a single wire center with 300 working lines, and assuming a utilization rate of 50%, they claim that the metallic cable costs should be calculated by using the lower cost per pair-foot of a single metallic cable sufficiently large to accommodate all working and spare lines needed in the wire center (in this case, a 600-pair cable). They allege that Verizon VA instead improperly calculates cable costs by basing them on the higher

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[79] In addition, there are several differences between the Popkin and the Turner TPIs that may produce seemingly erratic variations between them from one year to the next. For example, while Popkin produces one set of indexes for each year, applicable to the whole year, Turner produces January and July point-in-time indexes, which are combined via a weighted average (January = 25%; July = 50%; subsequent January = 25%). If input costs (copper prices, for instance) were always changing at a steady pace, these differences would be irrelevant; if, however, there are sudden price movements, the TPIs may be affected. In addition, the Turner TPI used by AT&T/WorldCom in their comparison is the South Atlantic regional index, which is mostly comprised of states *outside* of Verizon's region; most of the states in Verizon's region are included in Turner's North Atlantic Region.

[80] AT&T/WorldCom Rebuttal Panel at 39.

per pair-foot-cost of a 300-pair cable and then dividing by the utilization factor (50% in their example).[81]

Q. Is this criticism justified?

A. No. First, Verizon VA did not use the method criticized by AT&T/WorldCom (*i.e.*, using the number of lines in the wire center to select the cable size) to calculate its copper feeder costs. The copper feeder size was selected based on the typical copper feeder cable size identified for each UAA in the engineering survey. Using this typical copper feeder cable size likely *overstates* the copper feeder cable size (and thus understates per unit cost) in most cases. (Indeed, LCAM would produce a weighted average copper feeder cable size of *1,523* pairs.) This is because the engineers responded to the survey based on the then-existing Verizon VA network, in which copper feeder cable served more than 80% of all lines. In contrast, the forward-looking model uses copper feeder cable for only 18% of all lines. This far less frequent use of copper feeder cable in the forward-looking network would result in using smaller copper cables than in the existing network. Thus, basing the loop cost study on the same size feeder cables that are typically found in the existing network likely would lead to an understatement of forward-looking costs. Moreover, AT&T/WorldCom's suggested assumption of a single, very large copper feeder cable fails to reflect that, even in a forward-looking

[81] *Id.* at 38-39.

network, feeder facilities will be augmented incrementally over time. As a result, feeder routes in a forward-looking network are more likely to contain multiple cables of a smaller size rather than the single, very large cable that AT&T/WorldCom proposes.

Second, Verizon VA's methodology for calculating distribution cable costs similarly understates cable costs, by calculating those costs based on larger average cable sizes than would be used in the forward-looking network. The LCAM methodology takes the total working lines in the UAA (not the entire wire center, as in AT&T/WorldCom's flawed example) and divides by the number of DAs in the UAA to arrive at the average size for distribution cables in each UAA. This simplifying assumption produces a conservative, lower unit investment for copper distribution cable pairs. In reality, the lines in a DA are rarely all grouped together such that they can be served by one large cable, because cables emerge from the FDI to serve customers in multiple directions. Furthermore, distribution cables are tapered and branch to smaller sizes as the cables spread out into the DA. Using an example similar to AT&T/WorldCom's, if a particular DA (rather than the miniscule wire center proposed by AT&T/WorldCom) requires 300 total working pairs, Verizon VA's loop cost study would calculate copper distribution cable costs based on a 300-pair cable. Verizon VA did not increase the estimated cable size to account for utilization at this stage of the cost analysis because such an adjustment would grossly overstate the actual size of cables needed in the forward-looking network. In reality, customers in a DA typically will be located on multiple sides of an FDI, and thus, servicing the 300 lines would require a separate distribution cable emerging from the FDI in each direction where customers reside. Assuming that the customers in the hypothetical 300-line DA are evenly dispersed in three directions, each cable would be sized to serve only one-third of the total number of lines. The real distribution cables would thus be smaller (and more expensive on a per-unit basis) 200-pair cables (using the 50% fill factor in the AT&T/WorldCom example), rather than the less expensive 300-pair cable that AT&T/WorldCom point to as being assumed in Verizon VA's cost study. Moreover, the actual average distribution cable size would be even smaller than 200 pairs, because tapering would result in the use of smaller and smaller cables as the route moved farther from the FDI and branched down local streets. In fact, when Verizon VA computed the statewide average cable size produced by LCAM, the result was a 616 pair distribution cable; the recent weighted average size of all copper cables installed in Verizon VA (as reflected in VRUC) is 249.85. Thus, the use of the working lines in a DA to select the representative average distribution cable size is extremely conservative, because this method consistently selects a cable size that exceeds what would be used in a forward-looking network.

Q. So is AT&T/WorldCom's proposed "fix," described at pg. 40 of the AT&T/WorldCom Rebuttal Panel, appropriate or necessary?

A. No. In Verizon VA's studies, each unit of investment includes a portion of the fixed costs of the cable. And as noted, the unit costs are likewise understated because, if anything, the sizes modeled in the study are larger, not smaller, than those that would actually be used in the forward-looking network. AT&T/WorldCom's "fix" is therefore completely unnecessary.

3. Conduit Costs

Q. Are AT&T/WorldCom correct in asserting that Verizon VA, by using its historical average of installed conduit costs, fails to recognize that installed costs per foot decline as the amount of conduit installed increases? [AT&T/WorldCom Rebuttal Panel at 40.]

A. No. In fact, those costs are fairly fixed. The larger installation cost differentials suggested by Table 2 on page 41 of the AT&T/WorldCom Rebuttal panel most likely reflect the unique characteristics of the installation projects for the particular year. For example, if the projects for a particular year included installation of conduit in the Alexandria/Arlington area, which has a rocky terrain and is very urbanized, thus requiring paving and restoration, the total reported conduit installation costs for that year will be higher than for a year with more projects in areas where the installation projects were less expensive. Similarly, if the projects for the particular year included a significant number of manholes, which comprise an expensive element of conduit installation costs, that year's costs would be higher. Thus, where installation costs appear particularly low for a given year, the reasonable conclusion is that the projects for that year were simply of a less costly nature; the chart says nothing about how, holding all else equal, costs change across the board in relation to miles of conduit. What it does show, however, is that Verizon VA's approach, which averages costs over several years so as to capture years with less and more expensive projects, produces a reliable picture of conduit costs.

4. Pole Costs

Q. From a costing perspective, is AT&T/WorldCom correct that "sequential installation" of poles is the appropriate and most efficient assumption? [ATT/WorldCom Recurring Panel at 42.]

A. No. First, the idea of instantaneous installation of all poles needed in a network is a complete fantasy, and even if at all possible, such an effort would almost certainly result in far *higher* costs than Verizon VA experienced building out its network over the years. Economies of scope and scale produce efficiencies only up to a point, based on whether the materials and labor to meet the increased demand can even be mobilized. If Verizon VA (or a new competitor) were to seek to install *all* the poles in Verizon VA's network today, in a short enough time period as to enjoy the cost savings involved in eliminating the costs of what AT&T/WorldCom

calls "mobilization and demobilization,"[82/] the overtime labor costs alone likely would be devastating. And all the suppliers of the material and equipment necessary to meet the enormous and short-term pole installation demands would likewise face overtime and rush payment obligations, all of which would result in increased installation costs. And of course, the need to obtain so much material in so little time likely would create a shortage, putting Verizon VA at the mercy of suppliers. Furthermore, these suppliers would have no reason to provide discounts, given that Verizon VA would be a one-time customer making purchases only for its one-time installation project. Right-of-way issues, discussed above, also would arise in connection with this one-time future installation project, as would coordination with electric utilities and cable TV firms from whom Verizon VA rents poles.

Ultimately, this approach is just absurd, as it would be with respect to the estimation of costs for any facilities assumed to be installed at one time in a fantasy, scorched-node network. Verizon VA's actual experience with pole installations over the years provides a sound and testable starting place for estimating forward-looking pole costs. Over the years, Verizon VA has installed a large enough number of poles so that its

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[82/] AT&T/WorldCom Rebuttal Panel at 42.

cost figures present the most reliable range of installed pole costs.[83] There is simply no basis for AT&T/WorldCom's purely speculative argument that these costs should be discounted and replaced by the Synthesis Model's investment figure, which is entirely unrelated to Verizon VA's experience and ignores the realities of the Virginia market. Indeed, AT&T/WorldCom have pointed to no concrete reason that Verizon VA's pole costs should be reduced at all.

E. VERIZON VA'S UTILIZATION RATES ARE BASED ON THE FUNDAMENTAL NEEDS OF AN EFFICIENT, OPERATIONAL NETWORK AS WELL AS VIRGINIA'S REGULATORY SERVICE OBLIGATIONS

Q. Please explain AT&T/WorldCom's general criticisms of Verizon VA's utilization rates.

A. The AT&T/WorldCom Rebuttal Panel offers a handful of equally unavailing criticisms of Verizon VA's utilization rates. First, the Rebuttal Panel argues that cost studies should account only for capacity "properly attributed to current ratepayers (including CLECs, with respect to local loops) *without considering any capacity needed for future growth.*"[84] According to the AT&T/WorldCom Rebuttal Panel, Verizon VA's utilization factors are informed by engineering principles, and thus improperly reflect spare capacity that is intended to serve future demand,

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[83] AT&T/WorldCom Rebuttal Workpapers CD\Restatement of VZ Cost Studies\VA Other UNEs\VA IOF Study\VA Part D-2 IOF_Model_TurnerRestated.xls. (Attachment C.)

[84] AT&T/WorldCom Rebuttal Panel at 43.

which should not be paid for by current CLECs through UNE rates. With respect to this point, the AT&T/WorldCom Rebuttal Panel contends that whether or not the proposed utilization factors make sense from an engineering or operational perspective, they should be disregarded.

Second, the AT&T/WorldCom Rebuttal Panel argues that, even if efficient engineering guidelines *were* appropriate to use to determine utilization rates for the UNE cost study, Verizon VA's utilization factors are not consistent with such efficient engineering practices and guidelines, including Verizon VA's own engineering guidelines.[85/]

Q. Please respond to AT&T/WorldCom's argument that using engineering guidelines to determine utilization rates in a cost study is inappropriate because it produces spare capacity that should be paid for by future, rather than current, customers. [AT&T/WorldCom Rebuttal Panel at 42-43.]

A. First, AT&T/WorldCom make the entirely erroneous assertion that the spare capacity in an efficient network is built solely for the benefit of "future customers."[86/] A significant portion of spare capacity is necessary for proper administration and maintenance of the network for current customers. Moreover, whether or not particular units of spare capacity

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85/ *Id.* at 43-44.
86/ *Id.* at 43.

might be filled by future use does not change the fact that, if efficient engineering practices call for the installation of that capacity *today*, a carrier must bear the costs of installing and maintaining that capacity today; as Dr. Shelanski explains in his Rebuttal Testimony, that expense is a current cost of operating the network.[87] Because that spare capacity is a current engineering requirement, as future demand materializes to fill some portion of today's spare capacity, it will be necessary (and efficient) to install additional spare capacity — for general operational requirements, and to prepare for subsequent demand growth. Thus, at any given point in time, an efficient carrier will always have to bear current costs of spare capacity, some of which may be used by future demand growth. The current costs of that spare capacity are therefore appropriately borne by current users. AT&T/WorldCom's suggestion that future customers should pay for all spare (again, even assuming that the sole function of spare is growth), and that it thus should be "assumed away" for costing purposes, is therefore without merit.

Moreover, the costing approach that AT&T/WorldCom advocate is highly inefficient and would result in costs being *higher* for all CLECs. As explained in detail by the Verizon Panel Direct and below, it will in many instances be significantly more efficient to provision spare facilities now rather than provision relief facilities later, with the result being lower

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[87] Shelanski Rebuttal at 12-14.

overall costs for *all* customers, current and future. Tomorrow's CLECs — including AT&T and WorldCom — will benefit a few years from now in terms of both the lower cost and greater speed with which their UNE loop requirements can be met if Verizon VA can rely on existing distribution cable to serve its needs, rather than ripping up the roads and customer property every time new demand materializes. Today's customer similarly has benefited from earlier investments that produce such current cost savings.

Q. Is the AT&T/WorldCom Rebuttal Panel incorrect in asserting that requiring higher utilization rates is always more efficient?

A. No. There is a proper balance between the efficiencies of building a network that maximizes utilization and the inefficiencies associated with operating a network that lacks sufficient spare capacity to meet the firm's operational and customer-service obligations. As explained below, in the case of Verizon VA, the obligations imposed by the Virginia State Corporation Commission require sufficient spare capacity to be able to respond quickly and flexibly to service orders and requirements.

An analogy may be helpful in explaining the real-world need for spare capacity, and how such spare capacity serves the operational needs of current customers. Driving on a busy highway during rush hour provides an excellent example. If planners designed a highway with no emergency lanes, every mechanical breakdown or accident would produce significant delays. Instead, it is more efficient to pave an extra lane (sometimes two) in each direction so that the occasional breakdown does not produce such delays (or worse yet, accidents). In addition, it often will be more efficient to construct more lanes than are strictly necessary to accommodate current traffic loads, because the costs associated with repeatedly widening roads only as the highway reaches its maximum utilization is higher than the costs of building the extra lanes in advance of reaching the maximum utilization. But under AT&T/WorldCom's analysis, a TELRIC highway would be just wide enough to allow today's traffic loads to travel at the same speed, completely filling each lane with no emergency lanes. The critical drawbacks of this "efficient" roadway would become evident during the first traffic accident or rainstorm, or as soon as one car began speeding or slowing down.

The telecommunications network operates analogously. In principle, investments might initially be reduced by building a network that is sized with minimal amounts of spare capacity. But as a general principle, this is not preferable. Networks that have minimal amounts of spare capacity are rarely desirable or efficient. They are undesirable because they are not flexible enough to respond to new and varied service requests; insufficient space can lead to slow response times if new plant constantly must be installed to meet demand. In addition, such frequent capacity additions in smaller increments are highly inefficient, as explained in detail by the Verizon Panel Direct. AT&T/WorldCom's witness, Ms. Murray, herself seems to recognize that in cost studies, "it is never the correct choice — from an engineering economics perspective — to install growth capacity at a later point in time if the same capacity need could be met more cheaply (on an expected NPV basis) by installing capacity for both current demand and growth at the time of initial purchase."[88]

Q. Explain how the unique requirements imposed by the Virginia State Corporation Commission require Verizon VA to maintain a reasonable amount of spare capacity in its network.

A. The Virginia State Corporation Commission has adopted service quality requirements that apply to Verizon VA (and all other local exchange carriers). As explained further below, these requirements govern how quickly telephone companies in the Commonwealth must be able to respond to end-user service requests for new or additional services, and thus obligate Verizon VA to maintain a sufficient amount of spare capacity within the network. The Virginia Commission also has before it a pending proceeding to consider the adoption of similar requirements with respect to ILECs' provision of services and UNEs to CLECs; such standards similarly would dictate that Verizon VA maintain sufficient

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[88] AT&T/WorldCom Response to VZ-VA 7-28. (Attachment A.)

capacity in order to be able to respond promptly to CLEC requests. Maintaining sufficient spare capacity to permit flexible response to customer requests necessarily reduces utilization rates.

Q. Please describe the relevant service quality regulations.

A. Since 1993, the Virginia Commission has enforced rules governing service standards for local exchange carriers' provision of service to customers.[89] Under these rules, a LEC's performance is measured with respect to eight "key indicators," or service standards; failure to perform satisfactorily may result in sanctions under Virginia law, including fines of up to $10,000 per offense, per day.[90] The rules contain several standards that have a direct impact on the amount of capacity that Verizon VA must maintain in its network.

First, the Virginia Commission's standard is for all new single line service orders to be completed within five working days of the service application or the customer's requested completion date. Sufficient capacity accordingly must be available in various plant elements, such as distribution in particular, to allow Verizon VA to respond to new service requests. For example, this requirement makes it all the more important to install distribution cable while new developments are under construction,

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89/ 20 Va. Admin. Code § 5-400-80.

90/ *See, e.g., id.* §§ 56-483, 12.1-33.

even though the distribution cable may not be used for months after installation. Such pre-installed cable allows Verizon VA to provision orders far more quickly than otherwise would be possible which can be critical when, for example, a business sub-leases space to another business, which then orders a new primary line.[91/]

In addition, the Virginia Commission has established a standard allowing only a limited number of repeat trouble reports. Verizon VA therefore must have enough spare capacity available to quickly replace a defective line or facility.[92/] And Virginia Commission rules require a certain level of network switching performance, so that switch capacity must be sufficient to avoid blocked calls and otherwise perform satisfactorily.[93/]

Q. Please describe the service quality standards that Virginia is considering imposing on the provision of UNEs and other services to CLECs.

91/ And, of course, Verizon VA's allocation of 2-5 lines per customer location also allows it to quickly respond to requests from existing customers for second lines.

92/ *Id.*

93/ *Id.*

A. As this Commission is aware, although the Virginia Commission has not yet adopted standards concerning the provision of services to CLECs, its proceeding to adopt such standards is well underway.[94/]

The CLECs participating in that proceeding, in particular AT&T, have advocated use of guidelines adopted in New York, modified for Virginia. Those guidelines provide that Verizon VA must meet various deadlines with respect to provisioning orders for POTS and other services. A specific guideline addresses the circumstance where Verizon misses an order deadline with respect to provisioning UNE or resold services where "the cause of the delay is lack of facilities."[95/] Failure to meet the deadlines — even due to lack of facilities — may be the basis for monetary penalties. To meet these requirements with respect to provisioning CLEC orders, Verizon VA clearly must have a sufficient reserve of spare capacity to satisfy such expectations.

Q. Do any other Virginia requirements affect Verizon VA's need for spare capacity?

A. Yes. First, Verizon VA is a carrier of last resort under Virginia law, and thus must be prepared to serve any customer requesting service at any

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[94/] Establishment of a Collaborative Committee to Investigate Market Opening Measures, Case No. PUC000026, (March 2, 2000).

[95/] New York State Carrier-to-Carrier Guidelines Performance Standards and Reports, NY PSC Case 97 C 0139, Metric PR-5 (2000).

time. As explained above, Verizon VA must be prepared to provide such service immediately and thus must have sufficient capacity on hand to do so throughout its service area — regardless of whether demand has historically been low in a particular area.

In addition, as has been noted elsewhere in this testimony and as explained by Dr. Shelanski in his Direct Testimony, Verizon VA is subject to price cap regulation, which provides it with strong incentives to provision no more spare capacity than is economically efficient. As the Virginia Commission found when adopting price caps, that form of regulation provides incentives for "efficiencies" and "cost cutting."[96/] Verizon VA's utilization rates have remained relatively stable since the introduction of price caps — even, in certain cases, trending slightly lower, thus indicating that such rates have been and remain efficient.

For these reasons, as well as those explained above, Verizon VA engineers its networks in Virginia to provide spare capacity sufficient to allow for satisfactory and reliable performance, including responding to customer and CLEC orders. The utilization factors used in the Verizon VA loop study are based on Verizon VA's experience in building and operating a functioning network in Virginia that meets those needs and

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[96/] In the Matter of Investigating Telephone Regulatory Methods, Pursuant to Virginia Code § 56-235.5, Etc., Virginia State Corporation Commission, Case No. PUC930036 (Oct. 18, 1984).

that allows Verizon VA to provide service and meet customer demand on the schedule required by the Virginia Corporation Commission. Thus, Verizon VA's proposed utilization rates reflect the reality that efficient operating system capacity must be designed in anticipation of the volatility and uncertainty of customer demand. These requirements and operational realities will not change in the forward-looking network; the unsupported generalizations and distorted analyses offered by AT&T/WorldCom provide no basis for rejecting this proven operating experience.

Q. The AT&T/WorldCom Rebuttal Panel suggests that the utilization rates used by Verizon VA are simply current utilization rates, and thus cannot be defended as efficient and forward-looking. [AT&T/WorldCom Rebuttal Panel at 43.] Is there any truth to this contention?

A. It is true that in several cases, the fill factors that Verizon VA proposes are based on the actual utilization of the network today. Verizon VA has developed its factors in this way because its current network, like a forward-looking network, is the product of engineers that have sought to design and seek to operate the network in an efficient and productive fashion that permits Verizon VA to meet service requests in a timely fashion and avoid unnecessary costs. As noted above, Verizon VA operates under price caps today and thus has every incentive to achieve the most efficient utilization rates possible. Verizon's current utilization rates accordingly reflect the pro-competitive, price-reducing pressures that price caps are designed to exert, and these utilization rates have been quite stable following the introduction of price caps. Nothing about the basic operational realities of the telecommunications network as it develops and advances is expected to have a significant — if any — impact on fill factors. Thus, current utilization rates as observed and dictated by Verizon's engineers are not only reasonable, but the only logical place to look to determine what forward-looking utilization rates will and should be.

Q. Do you agree with AT&T/WorldCom's argument that Verizon VA departs from appropriate industry guidelines in calculating its utilization rates by failing to treat certain non-revenue generating capacity as "working" capacity for purposes of its cost studies? [ATT/WorldCom Rebuttal Panel at 48.]

A. No. AT&T/WorldCom is wrong in asserting that, when calculating certain utilization factors, Verizon should treat certain defective, idle and other non-revenue-generating units of capacity as "working" capacity, thus including those lines in the numerator of the utilization factor (over the denominator of all "available" capacity). Basic cost recovery principles dictate that Verizon VA can recover its costs only through *revenue generating units*. Because defective or idle (unassigned) units of capacity are obviously not revenue-generating — but clearly represent units in the network — Verizon VA must recover the costs of such units through revenue-generating units.

AT&T/WorldCom argue that this method is inconsistent with the approach used for *engineering* purposes and point to a Verizon document from West Virginia that purportedly demonstrates that such idle and defective pairs are included in the numerator of the utilization factor as "working" pairs. [97/] But this comparison is highly misleading and inapposite, as AT&T/WorldCom surely know. For engineering purposes, current fill summaries are used to determine how much spare capacity is available at a given time to serve demand without requiring repair, rearrangements, or capacity relief. Defective or idle assigned units of capacity of course do not meet this test. Thus, it makes sense in a pure engineering context to include such pairs in the numerator in order to get a sense of how much unassigned, functional spare capacity is available in the network at a given time.

Conversely, the administrative status (currently defective, idle-assigned, etc.) of this installed capacity is irrelevant to the economic question of how Verizon VA should recover the costs of these units of capacity. The only question for that purpose is whether the units are revenue-generating. To the extent they are not, their costs should be

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97/ AT&T/WorldCom Rebuttal Panel at 49.

recovered through rates charged for units that are available to generate revenue. Verizon VA's fill factors account for the fact that some percentage of such nonworking but available pairs will always be in the network, even though the specific pairs at issue do change. The levels of such spare capacity have remained stable over the years, and Verizon VA has no basis for expecting them to change in the forward-looking network.

Q. Is there any merit to AT&T/WorldCom's assertion that churn does not contribute to the distribution utilization rate, but only to whether the cable pair is "idle assigned" or "working"? [AT&T/WorldCom Rebuttal Panel at 50.]

A. No. This argument simply miscomprehends the purpose of using fill factors in cost studies. As AT&T/WorldCom point out, churn does produce so-called "idle assigned" cable pairs — that is, pairs that are connected to a customer location but that are not being utilized by any customer. But the claim that this does not impact the utilization rate of the cable for cost recovery purposes is entirely meritless. By definition, such "idle assigned" pairs are not available to produce revenue, and thus are not contributing to the company's recovery of its costs. A certain amount of churn is inevitable in the network and must be accounted for. The purpose of using a utilization rate analysis in cost studies is precisely to ensure that all pairs that *are* used to generate revenue contribute *pro rata* to recovery of the total cost of the distribution facilities. If "idle assigned" pairs resulting from churn were, as AT&T/WorldCom propose, included in the numerator as "working pairs," the result by definition would be to ensure that Verizon VA *underrecovered* its costs. This is because such idle pairs would, in effect, be responsible for contributing to cost recovery, and yet they could not in fact do so because they are not revenue-producing lines.

1. Utilization of Distribution

Q. What utilization rate do AT&T/WorldCom propose for distribution?

A. They propose a rate of 60%, and advocate that the Commission reject Verizon VA's actual and forward-looking distribution utilization rate of **[VERIZON PROPRIETARY BEGINS] [VERIZON PROPRIETARY ENDS]**.

Q. What are AT&T/WorldCom's criticisms of Verizon VA's distribution utilization factor?

A. AT&T/WorldCom claim that a large portion of spare distribution facilities are reserved for future growth, and the costs of these facilities should not be borne by current ratepayers, as explained above. AT&T/WorldCom also contend that, in a forward-looking network, it would be possible to serve existing customers with fewer spare distribution facilities in areas where demand has been stable for a long time.[98] Finally, AT&T/WorldCom contend that a forward-looking network would contain

[98] *Id.* at 47.